



# UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
-----------------	-------------	----------------------	---------------------	------------------

10/590,158

08/21/2006

Tomohiro Oshiyama

06571/HG

4142

1933 7590 10/01/2009  
FRISHAUF, HOLTZ, GOODMAN & CHICK, PC  
220 Fifth Avenue  
16TH Floor  
NEW YORK, NY 10001-7708

EXAMINER

WILSON, MICHAEL H

ART UNIT

PAPER NUMBER

1794

MAIL DATE

DELIVERY MODE

10/01/2009

PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

<b>Office Action Summary</b>	<b>Application No.</b> 10/590,158	<b>Applicant(s)</b> OSHIYAMA ET AL.	
	<b>Examiner</b> MICHAEL WILSON	<b>Art Unit</b> 1794	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☐ Responsive to communication(s) filed on \_\_\_\_.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-24 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-24 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 21 August 2006 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_.
  3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)          | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. ____.                                      |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)          | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date ____.  | 6) <input type="checkbox"/> Other: ____.                          |

## **DETAILED ACTION**

### ***Drawings***

1. The drawings are objected to as failing to comply with 37 CFR 1.84(p)(5) because they include the following reference character(s) not mentioned in the description:

Reference numbers 101-107 of figures 6 (a) and (b) are not found in the specification. Figures 6 (a) and (b) are discussed in the specification on page 150.

Corrected drawing sheets in compliance with 37 CFR 1.121(d), or amendment to the specification to add the reference character(s) in the description in compliance with 37 CFR 1.121(b) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

### ***Claim Objections***

2. Claims 3, 4, 11, 14, 23, and 24 are objected to because of the following informalities:

Regarding claim 3, the claim should read “provided that one of R<sub>1</sub> and R<sub>2</sub> is a substituent”.

Regarding claim 4, the claim should read “provided that one of R<sub>3</sub> and R<sub>4</sub> is a substituent”.

Regarding claim 11, the claim should read “provided that one of R<sub>27</sub> and R<sub>28</sub> is a substituent”.

Regarding claim 17, the claim should read “provided that one of R<sub>13</sub> - R<sub>28</sub> represents a substituent”.

Regarding claims 23 and 24, “a display devise” and “an illumination devise” should read “a display device” and “an illumination device”, respectively.

Appropriate correction is required.

### ***Claim Rejections - 35 USC § 112***

3. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

4. Claims 18, 19, and 21 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Regarding claims 18, 19, and 21, the claims are indefinite because it is unclear if "a carboline derivative or a carboline derivative" is intended to read "a carboline or a carboline derivative" encompassing a carboline. Further the scope of the claims is indefinite because it is unclear what is encompassed by the term carboline derivative.

### ***Claim Rejections - 35 USC § 102***

5. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

6. Claims 1-4, 12, 14, 15, 23 and 24 are rejected under 35 U.S.C. 102(b) as being anticipated by Takiguchi et al. (US 2003/0068535 A1).

Regarding claims 1-4, 12, 14, and 15, Takiguchi et al. disclose an organic electroluminescent element [0034] comprising an ortho-metallated platinum complex comprising an aryl group where free rotation is blocked (complexes 212-217 and 224-245 pages 17-18). Free rotation of the aryl group is blocked by a bridging carbonyl or methylene group (FL1 and FL2 page 7) which reads on substituent A (claim 12). The reference also discloses a device comprising a light-emitting layer which comprises the platinum complex ([0067]-[0068]).

Regarding claims 23 and 24, Takiguchi et al. disclose all the claim limitations as set forth above. Additionally the reference discloses a display device and an illumination device comprising an organic electroluminescent element as described above [0001].

7. Claims 1, 2, 11, 14, and 15 are rejected under 35 U.S.C. 102(b) as being anticipated by Igawa et al. (JP 2003/342284 A), machine translation relied upon.

Regarding claims 1, 2, 11, 14, and 15, Igawa et al. disclose an organic electroluminescent element [0015] comprising an ortho-metallated platinum complex, meeting instant formula (9), comprising an aryl group where free rotation is blocked (complexes 150-154 table 7 [0057] page 16). Free rotation of the aryl group is blocked by being ortho substituted to the bridging group (Cz and FI [0050] page 11). The reference also discloses a device comprising a light-emitting layer which comprises the platinum complex ([0015]-[0018]).

### ***Claim Rejections - 35 USC § 102/103***

8. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

9. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

10. Claims 1-4, 7, 8, 14, 15 and 16 are rejected under 35 U.S.C. 102(b) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over Kita et al. (JP 2003/109758 A), machine translation relied upon.

Regarding claims 1-4, 7, 8, 14, and 15, Kita et al. disclose an organic electroluminescent element [0017] comprising an ortho-metallated platinum complex comprising an aryl group where free rotation is blocked (complex 111 [0082] page 23). Free rotation of the aryl group is blocked by phenyl groups being present on the R<sub>1</sub>, R<sub>3</sub> and R<sub>4</sub> positions. The reference also discloses a light-emitting layer which comprises the platinum complex [0032] and a device comprising the light-emitting layer [0180].

The reference discloses an “n” of 3 with an “m” of 1 instead of an “n” of 1 or 2 as presently claimed. However  $n + m = 4$  is clearly an error in the reference. A stable octadentate platinum complex is not possible. The coordination sphere of platinum is full where there are only six ligands. Platinum(II) is a common platinum cation used to form luminescent complexes. This metal ion is well known to form square planar complexes ( $m=1$  and  $n=1$ ) due to its electron configuration ( $d^8$ ). Therefore one of ordinary skill in the art at the time of the invention would readily recognize  $m=3$  with  $n=1$

to be an error in the reference and would readily expect platinum complexes of  $m = 1$  and  $n = 1$  to suitable complexes for layer and device of Kita et al. and within the teachings of Kita et al.

Regarding claim 16, Kita et al. disclose all the claim limitations as set forth above. Additionally the reference discloses wherein the light-emitting layer comprises a host material [0107] of instant formula (10) (compound 1-60 [0123] page 47; compound 1-65 [0125] page 49)

### ***Claim Rejections - 35 USC § 103***

11. Claims 5, 6, 12, and 13 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kita et al. (JP 2003/109758 A), machine translation relied upon, as applied to claims 1 and 2 above.

Regarding claims 5 and 6, Kita et al. discloses all the claim limitations as set forth above. Additionally the reference discloses phenyl substituted in the R<sub>2</sub> position (complex 105 [0082] page 23). The reference also teaches that increasing the torsion angle between aryl and heteroaryl groups of phenylpyridine results in a blue shift in the emission of a complex ([0034] and [0043]) and further demonstrates phenyl and methyl groups are suitable for the R<sub>1</sub> and R<sub>2</sub> positions of the same ligand (compound 10, table 1 [0048] page 8). However the reference does not explicitly disclose a phenyl substituent in R<sub>2</sub> where free rotation is blocked.



It would be obvious to one of ordinary skill in the art at the time of the invention to reverse the phenyl and methyl groups of  $R_1$  and  $R_2$  in the ligand of compound 10 ([0048] page 8) and use the ligand as part of a platinum complex resulting in a complex of instant formulae (3) and (4). One of ordinary skill in the art would reasonably expect such a complex to have similar properties and be suitable for the same purpose given that Kita et al. teach phenyl and methyl substituents as suitable for either the  $R_1$  or  $R_2$  positions and teaches phenyl and methyl substituents used in the  $R_1$  and  $R_2$  positions of the same ligand. One of ordinary skill would be motivated by a desire to produce a new compound for the purposes of the prior art and within the teachings of the prior art, to create a complex with a high torsion angle between the aryl and heteroaryl groups of the phenylpyridine ligands resulting in a blue light-emitting complex as taught by Kita et al. [0034].

Regarding claims 12 and 13, Kita et al. disclose all the claim limitations as set forth above. Additionally the reference discloses wherein the aryl substituent may be substituted (compounds 41-44 [0077] page 18, and compound 114 [0082] page 23). However the reference does not explicitly disclose the aryl group where free rotation has been blocked with a substituent. While the reference does not explicitly disclose an example, this does not negate a finding of obviousness under 35 USC 103 since a preferred embodiment such as an example is not controlling. Rather, all disclosures "including unpreferred embodiments" must be considered. *In re Lamberti* 192 USPQ 278, 280 (CCPA 1976) citing *In re Mills* 176 USPQ 196 (CCPA 1972). Therefore, it would have been obvious to one of ordinary skill in the art to utilize a substituent on the

given that aryl group where free rotation has been blocked given that the reference teaches substituents are suitable for aryl substituents.

Additionally the reference does not explicitly disclose using an electron donating groups as substituent A (substituent on the aryl substituent of the phenylpyridine ligand). Electron withdrawing groups are specifically taught as substituents of the aryl group [0034]. However the use of electron donating groups would also be obvious to one of ordinary skill in the art at the time of the invention. One of ordinary skill in the art would reasonably expect that if electron withdrawing groups cause blue shifts in the emission, electron donating groups would cause a red shift in the emission. One of ordinary skill in the art would be motivated to use an electron donating groups as substituent A in order to tune the electron withdrawing/donating nature of the phenyl substituent to control the shade of blue light emitting by the complex.

12. Claims 1, 2, 9, 14 and 15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kamatani et al. (US 2003/0059646 A1).

Regarding claims 1, 2, 9, 14, and 15, Kamatani et al. disclose an organic electroluminescent device comprising a light-emitting layer with a phosphorescent complex ([0038]-[0041]). The phosphorescent complex is disclosed to be an iridium or platinum complex of phenylpyridine ([0041] and table 1-16 [0097], page 23) which is ortho-metallated [0082]. The reference also teaches a carbazolyl substituent on the phenyl ring of phenylpyridine (complexes 36 and 38, table 1-1 page 9).

The reference does not explicitly disclose the carbazoyl substituent bound to the R<sub>1</sub> position; however such a compound would be a positional isomer of the explicitly disclosed complexes of Kamatani et al. Compounds which are position isomers are generally of sufficiently close structural similarity that there is a presumed expectation that such compounds possess similar properties. *In re Wilder*, 563 F.2d 457, 195 USPQ 426 (CCPA 1977). See also *In re May*, 574 F.2d 1082, 197 USPQ 601 (CCPA 1978) (stereoisomers prima facie obvious). Therefore it would be obvious to one of ordinary skill in the art at the time of the invention to substitute the R<sub>1</sub> position with a carbazoyl substituent given that a carbazoyl substituent is explicitly taught as suitable in the R<sub>2</sub> and R<sub>3</sub> positions, which are both positional isomers of the R<sub>1</sub>-substituted compound.

The reference also does not explicitly disclose the carbazoyl substituent phenylpyridine bound to platinum. However such a complex would be obvious to one of ordinary in the art at the time of the invention. One of ordinary skill in the art would reasonably expect that platinum would be suitable given that both iridium and platinum are taught as suitable metals. One of ordinary skill in the art would be motivated by the desire to produce a new complex within the guidelines of the prior art for the purposes of the prior art.

Regarding claim 10, Kamatani et al. disclose all the claim limitations as set forth above. The reference does not explicitly disclose a carbazoyl substituent bound to the pyridine ring of phenylpyridine. However such a complex would be obvious to one of ordinary skill in the art at the time of the invention. The reference teaches either ring may be substituted [0082] and demonstrates carbazoyl bound to the phenyl ring

Art Unit: 1794

(complexes 36 and 38, table 1-1 page 9). One of ordinary skill in the art would reasonably expect placing the carbazolyl on the pyridyl ring to also be suitable because carbazolyl is taught as a suitable substituent and either ring is taught may be substituted. While a specific example is not given, this does not negate a finding of obviousness under 35 USC 103 since a preferred embodiment such as an example is not controlling. Rather, all disclosures "including unpreferred embodiments" must be considered. *In re Lamberti* 192 USPQ 278, 280 (CCPA 1976) citing *In re Mills* 176 USPQ 196 (CCPA 1972). Therefore, it would have been obvious to one of ordinary skill in the art to utilize a carbazolyl substituent on the pyridyl ring given that Kamatani et al. teaches each one.

Additionally the reference discloses any of the positions may be substituted. Substituting different positions of the pyridyl ring creates positional isomers. Compounds which are position isomers are generally of sufficiently close structural similarity that there is a presumed expectation that such compounds possess similar properties. *In re Wilder*, 563 F.2d 457, 195 USPQ 426 (CCPA 1977). See also *In re May*, 574 F.2d 1082, 197 USPQ 601 (CCPA 1978) (stereoisomers prima facie obvious). Therefore it would be obvious to one of ordinary skill in the art at the time of the invention to substitute a carbazolyl onto any position of the pyridyl ring of the phenylpyridine ligand.

Art Unit: 1794

13. Claims 16 and 17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sato et al. (US 2003/0218418 A9) in view of Kita et al. (JP 2003/109758 A), machine translation relied upon, as applied to claim 15 above.

Regarding claim 16, Sato et al. disclose an organic electroluminescent device comprising a light emitting layer with a phosphorescent ortho-metallated complex ([0031]-[0034]). The reference teaches the light-emitting layer comprises a host material of instant formulae (10) [0052]. The reference teaches compounds of instant formula (10) wherein the divalent linking group is a carbonyl (H-6, [0074]), an ethenylene (H-7, [0074]), thiophene (H-8, [0074]), fluorene (H-11, [0074]), aryl (H-10, [0074]), or amine (H-11 to H-33, [0074]). However the reference does not explicitly disclose a phosphorescent complex with an aryl group where free rotation is blocked.

Kita et al. disclose an ortho-metallated platinum complex wherein free rotation of an aryl group is blocked, as described above. Additionally the reference teaches the complexes of Kita et al. to have excellent luminescence with blue color [0032].

It would be obvious to one of ordinary skill in the art at the time of the invention to use the complex of Kita et al. in the device of Sato et al. One of ordinary skill in the art would reasonably expect such a combination to be suitable given that both references teach light-emitting layers with carbazole host materials and Kita et al. teach complexes suitable for use in the light-emitting layer of an electroluminescent device. One of ordinary skill in the art would be motivated by a desire to have excellent luminescent of blue.

Regarding claim 17, Sato et al. disclose an organic electroluminescent device comprising a light emitting layer with a phosphorescent ortho-metallated complex ([0031]-[0034]). The reference teaches the light-emitting layer comprises a host material of instant formulae (10) [0052]. The reference also teaches that the divalent linking groups (instant  $L_{01}$ ) may also be a single bond [0062] and teaches that any position of the phenyl rings is suitable for substitution [0056]. While Sato et al. does not exemplify a substituent in the instant  $R_{13}$ - $R_{16}$  positions, this does not negate a finding of obviousness under 35 USC 103 since a preferred embodiment such as an example is not controlling. Rather, all disclosures "including unpreferred embodiments" must be considered. *In re Lamberti* 192 USPQ 278, 280 (CCPA 1976) citing *In re Mills* 176 USPQ 196 (CCPA 1972). Therefore, it would have been obvious to one of ordinary skill in the art to utilize a substituent in one of more of the instant  $R_{13}$ - $R_{16}$  positions given that Sato et al. teaches each one. However the reference does not explicitly disclose a phosphorescent complex with an aryl group where free rotation is blocked.

Kita et al. disclose an ortho-metallated platinum complex wherein free rotation of an aryl group is blocked, as described above. Additionally the reference teaches the complexes of Kita et al. to have excellent luminescence with blue color [0032].

It would be obvious to one of ordinary skill in the art at the time of the invention to use the complex of Kita et al. in the device of Sato et al. One of ordinary skill in the art would reasonably expect such a combination to be suitable given that both references teach light-emitting layers with carbazole host materials and Kita et al. teach complexes suitable for use in the light-emitting layer of an electroluminescent device. One of

Art Unit: 1794

ordinary skill in the art would be motivated by a desire to have excellent luminescent of blue.

14. Claim 18 is rejected under 35 U.S.C. 103(a) as being unpatentable over Kita et al. (JP 2003/109758 A), machine translation relied upon, as applied to claim 15 above, Iwakuma et al. (US 2004/0086745 A1).

Regarding claim 18, Kita et al. disclose all the claim limitations as set forth above. However the reference does not explicitly disclose a carboline compound as a host material.

Iwakuma et al. teach carboline compounds (compound A58-A67, pages 16-18) as host materials for the light-emitting layer [0008] of an electroluminescent device ([0012] and [0058]). The reference teaches that using a carboline compound of Iwakuma et al. improves the color purity of the device [0007].

It would be obvious to one of ordinary skill in the art at the time of the invention to use a carboline compound as the host material of the light-emitting layer as taught by Iwakuma et al. in the device of Kita et al. One of ordinary skill in the art would reasonably expect such a combination to be suitable given that Iwakuma et al. the carboline compounds as suitable host material for phosphorescent light-emitting layers. One of ordinary skill in the art would be motivated by a desire to improve the color purity of the device.

15. Claim 19 is rejected under 35 U.S.C. 103(a) as being unpatentable over Kita et al. (JP 2003/109758 A), machine translation relied upon, as applied to claim 15 above, and in view of Okada et al. (US 2003/0019861 A1).

Regarding claim 19, Kita et al. disclose all the claim limitations as set forth above. However the reference does not explicitly disclose a hole blocking layer.

Okada et al. teach a light-emitting device [0007]. The reference teaches various condensed heterocyclic compounds, formulas (I) and (II), are useful in electroluminescent devices ([0009]-[0012]) and teaches specific examples of heterocyclic groups suitable as A of formula (I) and B of formula (II) ([0041] and [0051]); the groups includes carboline. The reference teaches that materials of the electron transport and electron injection layers should possess electron transporting properties and hole blocking properties [0157]. Preferred materials include compounds of formula (I).

It would have been obvious to one of ordinary skill in the art at the time of invention to use the carbolines of Okada as an electron transporting and hole blocking layer in the device of Kita et al. One of ordinary skill in the art would reasonably expect such a combination to be suitable given that Okada et al. teach the compounds to be electron transporting and hole blocking and suitable for use in electroluminescent devices. One of ordinary skill in the art would be motivated by a desire to block holes from reaching the cathode, thus improving performance.



16. Claim 20 is rejected under 35 U.S.C. 103(a) as being unpatentable over Kita et al. (JP 2003/109758 A), machine translation relied upon, as applied to claim 15 above, and in view of Stossel et al. (US 2004/0058194 A1).

Regarding claim 20, Kita et al. disclose all the claim limitations as set forth above. Additionally the reference discloses boron compounds as electron transporting material for the electron transport layer [0199]. However the reference does not explicitly disclose a hole blocking layer.

Stossel et al. teach another phosphorescent organic light-emitting device [0001]. The reference teaches that boron compounds have excellent properties for electron transport and hole blocking layer [0032] and lead to high efficiencies and an increase in operating life ([0035]-[0036]).

It would be obvious to one of ordinary skill in the art at the time of the invention to use boron compounds in an electron transporting and hole blocking layer as taught by Stossel et al. in the device of Kita et al. One of ordinary skill in the art would reasonably expect such a combination to be suitable given that Kita et al. teach boron compounds to be suitable for the electron transporting layer, and Stossel et al. teach boron compounds to be excellent hole blocking materials. One of ordinary skill in the art would be motivated by a desire to improve efficiency and an increase in operating life.

17. Claim 21 is rejected under 35 U.S.C. 103(a) as being unpatentable over Seo et al. (US 2000/0086180 A1) in view of Kita et al. (JP 2003/109758 A), machine translation relied upon, as applied to claim 1 above, and Iwakuma et al. (US 2004/0086745 A1).

Regarding claim 21, Seo et al. disclose an organic electroluminescent element [0002]. The reference discloses the device comprises a light-emitting layer with an ortho-metallated phosphorescent compound and a host material ([0187] and [0251]-[0252]), and a hole blocking layer ([0041] and [0251]-[0252]). The blocking and light-emitting layers are mixed, therefore the hole blocking, light-emitting, and light-emitting host materials are in both hole blocking and light-emitting layers ([0044] and [0251]-[0252]). However the reference does not explicitly disclose a phosphorescent complex with an aryl group where free rotation is blocked or a carboline as the light-emitting host material.

Kita et al. disclose an ortho-metallated platinum complex wherein free rotation of an aryl group is blocked, as described above. Additionally the reference teaches the complexes of Kita et al. to have excellent luminescence with blue color [0032].

It would be obvious to one of ordinary skill in the art at the time of the invention to use the complex of Kita et al. in the device of Seo et al. One of ordinary skill in the art would reasonably expect such a combination to be suitable given that both references teach light-emitting layers with carbazole host materials and Kita et al. teach complexes suitable for use in the light-emitting layer of an electroluminescent device. One of ordinary skill in the art would be motivated by a desire to have excellent luminescent of blue.

Iwakuma et al. teach carboline compounds (compound A58-A67, pages 16-18) as host materials for the light-emitting layer [0008] of an electroluminescent device

Art Unit: 1794

([0012] and [0058]). The reference teaches that using a carboline compound of Iwakuma et al. improves the color purity of the device [0007].

It would be obvious to one of ordinary skill in the art at the time of the invention to use a carboline compound as the host material of the light-emitting layer as taught by Iwakuma et al. in the device of Seo et al. One of ordinary skill in the art would reasonably expect such a combination to be suitable given that Iwakuma et al. the carboline compounds as suitable host material for phosphorescent light-emitting layers. One of ordinary skill in the art would be motivated by a desire to improve the color purity of the device.

18. Claim 22 is rejected under 35 U.S.C. 103(a) as being unpatentable over Seo et al. (US 2000/0086180 A1) in view of Kita et al. (JP 2003/109758 A), machine translation relied upon, as applied to claim 1 above, and Stossel et al. (US 2004/0058194 A1)..

Regarding claim 22, Seo et al. disclose an organic electroluminescent element [0002]. The reference discloses the device comprises a light-emitting layer with an ortho-metallated phosphorescent compound and a host material ([0187] and [0251]-[0252]), and a hole blocking layer ([0041] and [0251]-[0252]). The blocking and light-emitting layers are mixed, therefore the hole blocking, light-emitting, and light-emitting host materials are in both hole blocking and light-emitting layers ([0044] and [0251]-[0252]). However the reference does not explicitly disclose a phosphorescent complex with an aryl group where free rotation is blocked or a boron compound as the hole blocking material.

Kita et al. disclose an ortho-metallated platinum complex wherein free rotation of an aryl group is blocked, as described above. Additionally the reference teaches the complexes of Kita et al. to have excellent luminescence with blue color [0032].

It would be obvious to one of ordinary skill in the art at the time of the invention to use the complex of Kita et al. in the device of Seo et al. One of ordinary skill in the art would reasonably expect such a combination to be suitable given that both references teach light-emitting layers with carbazole host materials and Kita et al. teach complexes suitable for use in the light-emitting layer of an electroluminescent device. One of ordinary skill in the art would be motivated by a desire to have excellent luminescent of blue.

Stossel et al. teach another phosphorescent organic light-emitting device [0001]. The reference teaches that boron compounds have excellent properties for electron transport and hole blocking layer [0032] and lead to high efficiencies and an increase in operating life ([0035]-[0036]).

It would be obvious to one of ordinary skill in the art at the time of the invention to use boron compounds in the hole blocking layer of Seo et al. One of ordinary skill in the art would reasonably expect such a combination to be suitable given that Stossel et al. teach boron compounds to be excellent hole blocking materials. One of ordinary skill in the art would be motivated by a desire to improve efficiency and an increase in operating life.

### ***Double Patenting***

19. The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the “right to exclude” granted by a patent and to prevent possible harassment by multiple assignees. A nonstatutory obviousness-type double patenting rejection is appropriate where the conflicting claims are not identical, but at least one examined application claim is not patentably distinct from the reference claim(s) because the examined application claim is either anticipated by, or would have been obvious over, the reference claim(s). See, e.g., *In re Berg*, 140 F.3d 1428, 46 USPQ2d 1226 (Fed. Cir. 1998); *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) or 1.321(d) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent either is shown to be commonly owned with this application, or claims an invention made as a result of activities undertaken within the scope of a joint research agreement.

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

20. Claims 1-11, 15, 18, 23, and 24 are provisionally rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 1, 2, 9, 13, 18-43, 45, and 46 of copending Application No. 11/632389. Although the conflicting claims are not identical, they are not patentably distinct from each other because while the claims are not identical one of ordinary skill attempting to make and use the invention of the copending application would also be making and using the presently claimed invention.

The copending application teaches an organic electroluminescent element (claims 1 and 2) comprising a phosphorescent ortho-metallated platinum complex of instant formulae (1)-(9) (claim 9) and a carboline or carboline derivative compound

Art Unit: 1794

(claims 13, and 18-43) in the light-emitting layer. The reference teaches the organic electroluminescent element as part of a display device or an illumination device (claims 45 and 46).

This is a provisional obviousness-type double patenting rejection because the conflicting claims have not in fact been patented.

21. Claims 1-11, 15, 18, 23, and 24 are directed to an invention not patentably distinct from claims 1, 2, 9, 13, 18-43, 45, and 46 of commonly assigned 11/632389. Specifically, see above.

The U.S. Patent and Trademark Office normally will not institute an interference between applications or a patent and an application of common ownership (see MPEP Chapter 2300). Commonly assigned 11/632389, discussed above, would form the basis for a rejection of the noted claims under 35 U.S.C. 103(a) if the commonly assigned case qualifies as prior art under 35 U.S.C. 102(e), (f) or (g) and the conflicting inventions were not commonly owned at the time the invention in this application was made. In order for the examiner to resolve this issue, the assignee can, under 35 U.S.C. 103(c) and 37 CFR 1.78(c), either show that the conflicting inventions were commonly owned at the time the invention in this application was made, or name the prior inventor of the conflicting subject matter.

A showing that the inventions were commonly owned at the time the invention in this application was made will preclude a rejection under 35 U.S.C. 103(a) based upon the commonly assigned case as a reference under 35 U.S.C. 102(f) or (g), or 35 U.S.C. 102(e) for applications pending on or after December 10, 2004.

***Conclusion***

22. Any inquiry concerning this communication or earlier communications from the examiner should be directed to MICHAEL WILSON whose telephone number is (571) 270-3882. The examiner can normally be reached on Monday-Thursday, 7:30-5:00PM EST, alternate Fridays off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Larry Tarazano can be reached on (571) 272-1515. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

23. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/D. Lawrence Tarazano/  
Supervisory Patent Examiner, Art Unit 1794

MHW